

An Internal Rate of Return Analysis  
of the Investment Value  
of Whole Life Insurance

An Honors Thesis (ID 499)

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## CHAPTER I

### The Problem

#### INTRODUCTION

##### The Investment Environment

The task of providing sufficient funds for the maintenance of one's standard of living during the retirement years has historically proved formidable. Since the onset of serious inflation, however, the problem has increased alarmingly with respect to both the difficulty in actually achieving financial security and the importunate influence of this security on the survival of the elderly. The time when the mere saving of part of each paycheck over the working life virtually guaranteed a secure retirement is gone; what was once simply a matter of thrift and diligence has been transformed into a futile struggle to protect assets from inflation.

Because inflation has such a devastating effect on money held for future use, every citizen is compelled to make the transition from saver to investor. Suddenly every wage earner is preoccupied with yields, risks, and other aspects of financial instruments. They demand information about and invest their savings in financial assets about which they were unconcerned

and unaware only a few years before. Consequently, the majority of these persons is making critical decisions regarding their well-being and that of their dependents within the complex world of financial markets, a world which frequently perplexes even the experts.

While a fortunate few choose worthwhile investments and are able to amplify their savings, most Americans, lacking the necessary information, sophistication, or luck, fail to realize their investment objectives. Many, gambling wildly on some illusory security promising unrealistic yields, are surprised by the disappearance of their savings and security when the venture collapses. Others, clinging to the American ethic of the savings institution, watch helplessly as their money, though relatively free of default risk, nevertheless loses ground to inflation. In general, today's market offers no simple solution to the dilemma of balancing a high degree of safety against a competitive yield.

#### The Role Of Insurance In Financial Planning

Though whole life insurance has traditionally occupied a position in the financial plans of most families, it is seldom if ever classified as a yield-bearing investment. Rather, consumers view life insurance as a necessary evil. They believe that their

funds would earn a larger income on almost any other type of financial instrument, yet they acknowledge the fact that a whole life insurance policy guarantees a minimum dollar amount in the form of a cash value or death benefit. Simultaneously, the insurance policy includes an intrinsic incentive to save; people tend to pay a monthly premium more readily than a voluntary contribution to a savings account. These factors in combination produce the result that nearly everyone obtains life insurance, thereby securing a sum for future use. Attempts are frequently made, however, to minimize the monthly cost of the life insurance purchase, because of the perception that insurance is a "poor investment."

The assumption that a whole life insurance policy is a highly inferior method of preserving funds for use in later years may be erroneous. In spite of the fact that whole life insurance is not usually regarded as an investment, it can be demonstrated that certain types of whole life insurance policies can indeed generate an after-tax return competitive with that of many other financial instruments.

### Statement of the Problem

The problem under consideration concerns the value of whole life insurance as a method of earning a satisfactory income on funds committed to the policy. The analysis will be contingent upon the age of the policyholder, and the after-tax rate of return which must be obtained on funds available for independent investment from any savings realized by the purchase of a term rather than whole life policy. The investigation will compare what those who bring their money to the financial markets must earn to render their investments competitive with the accumulated cash value guaranteed by the insurance policy.

### Significance of the Study

The almost universal preoccupation of today's society with inflation, financial security, and investments mandates that the whole life insurance policy be considered with respect to its validity as an alternative means of preserving savings. The study does not purport that the internal yield on the whole life insurance policy will exceed the current rate of inflation and therefore provide a simple solution to the question of how to adequately protect funds. What is



proposed, however, is that after the effects of income taxes and other factors are included in the evaluation, for certain age categories whole life insurance emerges as a sound supplement or replacement for other, more traditional, investments purchased in the financial markets.

The implications from the conclusions reached in the study will be extensive. The information could influence the purchase decision of the life insurance-buying public, which comprises virtually all heads of households. By indicating whether a whole life policy will expedite the realization of the financial goals of the individual or family, or by demonstrating that a consumer might more easily increase his wealth through the purchase of a less-expensive term policy and the independent investment of the price differential, the optimal policy is indicated for each age group.

#### Implications For The Life Insurance Industry

Ultimately, the results of the investigation could have a significant impact upon the present proportions of each type of policy sold. This is of paramount importance to the entire life insurance industry. First of all, as the demand for a particular

policy is altered by the new information, the composition of the policyholders is similarly transformed. Actuaries and underwriters must anticipate any accompanying changes in mortality trends. Furthermore, the life insurance company as a unit will be compelled to adjust marketing and distribution strategies in the face of the potential shifts in demand. Lastly, the individual insurance agent is the cornerstone of life insurance sales; hence, it is imperative that he, too, is aware of any new consumer preferences, so that the demand can be met at its most fundamental level.

#### Scope of the Study

Inflation is perhaps the most critical long-term problem facing every nation of the world. Not only does it pose a threat to financial security, but it is particularly troubling because there is no ready solution available to those most adversely affected by long-run price escalation. This study seeks to demonstrate, however, that certain types of whole life insurance are superior to other financial instruments with regard to the level of risk and the after-tax rate of return. The information will lead to the purchase of the life insurance policy which optimally utilizes the funds of the buyer.

Specifically, each insurance policy under consideration will be evaluated on the basis of the after-tax return on the cash value of the policy which results from the application of dividends against the premium cost for each age of the policyholder, within the span of the normal working life. Also, the extraction from the cost of the whole life insurance of the term insurance premium enables the data to be analyzed from the perspective of the term insurance purchaser; in this way the question of whether the greater benefit lies in whole life insurance, or in buying a term policy and investing the difference in premium in the open market is resolved. In addition to the numeric data, the study will define the types of life insurance policies under study in order that the prospective buyer may know not merely which policy is recommended, but will also have a reasonable understanding of the policy itself.

#### Basic Assumptions

1. The internal rate of return on the cash value is an accurate measure of the true yield of the policy.

2. The amount of default risk on life insurance is negligible.
3. The data from the Northwestern Mutual Life Insurance Company are representative of other life insurance companies of a similarly high caliber.
4. Any shifts in demand will not affect mortality experience significantly enough to alter the fundamental rate structure.
5. All internal rates of return are expressed on an after-tax basis.

#### Definition of Terms

The study of insurance, like any other discipline, requires a knowledge of the terms common to the field. While the nature of life insurance dictates that the public possess at least some awareness of the meanings of industry jargon, a more thorough understanding of terms germane to the topic will expedite comprehension of the analysis. Therefore, the meanings will be clarified below.

Cash Value: When premiums are consistently paid, the insurance company places them in a fund where they accumulate. They

also earn an income, or dividend.

Therefore, the cash value is the aggregate amount of the premiums and all dividends received, minus any outstanding loan balance and all administrative expenses incurred by the insurance company.

Extra Ordinary Life Insurance: Extra ordinary life insurance, or EOL, is a product of the Northwestern Mutual Life Insurance Company. In an effort to provide the advantages of whole life insurance at a somewhat lower cost, the company combines seventy percent whole life with decreasing amounts of term insurance, which comprise the remainder. After the aggregate premium payments, which are level over the life of the policy, equal the total amount of the term insurance, the term disappears altogether and the EOL policy assumes the characteristics of a typical whole life policy. To this end, all dividends must

remain with the policy for several years, in order that they can purchase paid-up additions of whole life which gradually replace the term insurance. Once all term insurance is eliminated, the dividends are at the disposal of the policyholder.

Internal Rate of Return: The internal rate of return is "the interest rate that equates the present value of the expected future receipts to the cost of the investment outlay."<sup>1</sup> The formula for the internal rate of return is:

$$C = \frac{R_1}{(1+r)^1} + \frac{R_2}{(1+r)^2} + \dots + \frac{R_N}{(1+r)^N},$$

where C is the present value of the cash outlay; R is the cash inflow for each period; N is the number of periods; and r is the internal rate of return on the investment. In this study, the basic formula is slightly altered to accommodate the characteristics of the life insurance policy. The model for the computation of the internal rate of

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<sup>1</sup>J. Fred Weston and Eugene F. Brigham, Essentials of Managerial Finance, 2nd ed., (New York: Holt, Rinehart and Winston, Inc., 1971), p. 154.

return on the cash value of the whole life policy is:

$$CV = P_1(1+i)^n + P_2(1+i)^{n-1} + \dots + P_n(1+i)^1 .$$

In this case, CV is equal to the cash value of the whole life policy; P is the effective annual cost of the whole life insurance; n is the number of periods; and i is the internal rate of return on the cash value.

Life-to-65: This form of insurance, often called "65-life," is merely a variation of regular whole life. The distinction between the two policies centers on the premium. Both are whole life policies, with a level premium and an increasing cash value, but while the whole life premium is paid over one's entire life, the payments of the life-to-65 policy are accelerated, with the result that the policy is fully paid up by the time the policyholder attains the age of sixty-five, and, as with normal whole life, the full death

benefit is available regardless of how many premium dollars have been collected. The premiums are larger, since the payment period is reduced, but an advantage accrues to the holder of a 65-life policy, because the premium expenses cease at the age of sixty-five, when retirement brings a substantial reduction in income.

Limited-Pay Life Insurance: Limited-pay in-

surance policies, like whole life, protect the insured for as long as he lives. They, too, build a cash value. The policies differ only in the length of time required to pay all premiums. Whole life premiums are paid until the policyholder dies, or until he reaches age one hundred. Limited-pay policies, on the other hand, specify the period within which all premiums shall be paid. The period may be twenty, ten, or five years, or the policy may even be purchased



with a single lump-sum premium. The monthly premiums are adjusted in accordance with the length of time available for payment, and when the payment period has expired, the insured still receives lifetime coverage. 65-EOL and 65-life are both examples of limited-pay life insurance.

65-EOL: 65-EOL is identical to regular EOL, except that, as in the case of 65-life, all premiums have been collected by the time the policyholder reaches age sixty-five.

Term Insurance: This form of life insurance protects the insured for a specified length of time. For instance, if a person buys a five-year term policy, and he dies within those five years, his beneficiaries will receive the face amount of the policy. There is no accumulation of a cash value, and most term policies do not offer dividends. Because of these factors,

for young people term insurance is inexpensive. Due to the larger probability of death in later years, however, the premium does increase with age, and a physical examination is frequently required for each new policy, which may render acquisition difficult or impossible at advanced ages. Also, since no cash values accrue to the policy, there are no residual benefits to the policyholder should he survive the term.

Whole Life Insurance: The whole life policy pays a benefit of the face amount of the policy upon the death of the insured. Should the policyholder live to one hundred years of age, the insurance company may consider him deceased and pay the face amount at that time, or the insured may elect to leave the money with the company, where it continues to draw interest. The distinguishing characteristics of whole life insurance, however, are the level

lifetime premium, and the cash value that is accumulated with the remittance of each premium. On participating policies, which earn interest, these aggregated premiums receive annual dividends, which enhance the attractiveness of whole life insurance. The policyholder possesses a steadily growing fund which is available to him even if death or maturity of the policy does not occur: loans may be withdrawn from the cash value at any time. They may be repaid along with a nominal interest charge; though there is no obligation to do so. Any outstanding loans are merely deducted from the benefit at death.

#### Design of Study

The study begins with an introduction underscoring the necessity of conducting such an inquiry. The problem is then stated, followed by explanations of the significance and scope of the investigation, after which the basic assumptions are included, and all terms are defined. This portion of the study concludes with a survey of the design of the examination and a consideration of related literature.

The second chapter contains a detailed description of the method employed in obtaining the numeric results. Briefly, four whole life policies are considered: regular whole life, 65-life, EOL, and 65-EOL. Each policy is evaluated at thirty different ages, from twenty-one to fifty. The data utilized in the study assume identical face amounts of the policy of one hundred thousand dollars. The internal rate of return on the cash value will be used as the indicator of the relative worth of each policy as a means of preserving savings. Next, the data are presented in tabular and graphical form. Explanations of the significance of the data follow.

The third section presents a summary of the information generated by the study. Subsequently, the conclusions are advanced. Finally, the inquiry is completed by offering suggestions for further study.

### Related Literature

Although the classic question of whole life versus "buy term, invest the difference" has received extensive thought, this particular aspect of the issue has heretofore remained unexamined. One similar, but not identical study has been conducted and refuted.

It concerns the subject of purchasing whole life insurance and investing funds borrowed from the cash value. An extensive analysis was made regarding the rates of return on whole life insurance, though the manner in which these rates of return were compiled was not revealed. Also, the original study, and the contradiction, revolved around the rates of return necessary to justify the use of the cash value as a means of achieving leverage. The results were ambiguous, with neither side providing a convincing conclusion.<sup>2</sup> The study differs fundamentally from this investigation in that term insurance was not considered.

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<sup>2</sup>Serge Matulich, "Borrowing Rates, Alternative Investment Sets, and the Life Insurance Purchase Decision: Comment," Journal of Risk and Insurance, No. 44 (September, 1977), pp. 493-501.

## CHAPTER II

### Results

#### RESEARCH METHODOLOGY

##### The Time Frame

Before the internal rate of return on the cash value can be determined, it is imperative that the length of time over which costs and benefits will be incurred be delineated. The period under consideration encompasses a thirty-year span, for males from ages twenty-one to fifty, inclusive. The reasons for the selection of each age extreme differ. The lower parameter was chosen because twenty-one is the year in which young people typically assume many of the responsibilities of adulthood and therefore have a need for more than nominal amounts of insurance. The upper boundary of fifty results from the nature of the term insurance rate data: no rate information was available beyond age sixty-nine.

The absence of data after age sixty-nine is a limiting factor because the internal rates of return for life insurance buyers of a given age are computed using premium and dividend data for the twenty years following the purchase of the policy. This in turn results from restrictions inherent in the data: the whole life information lists dividends

for only twenty years after the policy is bought. Thus, a thirty-five year old buyer is concerned with the term insurance figures from years thirty-five through fifty-four. Similarly, the calculations for a fifty year old man originate from years fifty through sixty-nine; hence the upper constraint imposed by the rate data.

### The Computations

Since this study represents the initial examination of the question from this particular perspective, it was necessary to develop an original algorithm in order to determine each result. In this case, the calculations were performed on a computer, through the medium of a Fortran language program, illustrated in Figure 2-1. The input data are drawn from the insurance rate manuals of the Northwestern Mutual Life Insurance Company of Milwaukee, Wisconsin.

Preparatory to making the required computations, the program requires several items of information. These input items consist of the whole life insurance premium for each of the four policies, their attending dividends and cash values, and the premium cost of the Northwestern term policy and its dividends, which incidentally are relatively uncommon among

Figure 2-1  
 "Internal Rate of  
 Return" Program

```

100      INTEGER NSETS,I,J,IAGE,NYEARS
200      REAL WHLFPR,WHLDIV(20),TERMPR(20),TRMDIV(20)
300      REAL CASHVL,TOTINV,DIFF(20),RATE
400 C    READ NUMBER OF SETS OF DATA TO BE PROCESSED
500      WRITE(5,10)
600 10   FORMAT(5X,'IT IS TIME TO PUT IN NSETS')
700      READ(5,*) NSETS
800 C    LOOP FOR EACH SET OF DATA...
900      DO 70 I=1,NSETS
1000     WRITE(3,13)
1100 13  FORMAT('1',5X,'AGE',5X,'REQUIRED AFTER TAX
1200     9 RATE OF RETURN ON INVESTMENT')
1300 C    READ IN CONSTANTS FOR THIS SET OF DATA
1400     WRITE(5,15)
1500 15  FORMAT(5X,'TIME TO PUT IN THE CONSTANTS')
1600     READ(5,*) WHLFPR,IAGE,CASHVL,RATE,NYEARS
1700 C    READ IN WHOLE LIFE DIVIDEND, TERM PREMIUM, AND
1800 C    TERM DIVIDEND FOR JTH YEAR
1900     WRITE(5,20)
2000 20  FORMAT(5X,'TIME TO PUT IN WHLDIV')
2100     READ(5,*)(WHLDIV(J),J=1,20,1)
2200     WRITE(5,21)
2300 21  FORMAT(5X,'TIME TO PUT IN THE TERMPR')
2400     READ(5,*)(TERMPR(J),J=1,20,1)
2500     WRITE(5,22)
2600 22  FORMAT(5X,'TIME TO PUT IN THE TRMDIV')
2700     READ(5,*)(TRMDIV(J),J=1,20,1)
2800 C    CALCULATIONS FOLLOW...
2900     DO 30 J=1,21
3000     DIFF(J)=WHLFPR-WHLDIV(J)-(TERMPR(J)-TRMDIV(J))
  
```



Figure 2-1, continued

```

3100 30  CONTINUE
3200 35  RATE=RATE+.0001
3300     TOTINV=0
3400     DO 37 K=1,20
3500     TOTINV=TOTINV+(DIFF(K)*((1+RATE)**(NYEARS-K)))
3600 37  CONTINUE
3700     IF (TOTINV .LE. CASHVL) GO TO 35
3800     WRITE(3,40) IAGE,RATE
3900 40  FORMAT(' ',5X,I2,25X,F8.4)
4000 C   END OF "I" LOOP
4100 70  CONTINUE
4200     STOP
4300     END

```

term policies currently on the market. In addition, for mechanical purposes, the policyholder's age and a percentage rate close to zero are entered into the computer, as is a number which instructs the machine to execute each of the program loops a given number of times.

The initial step in the actual arithmetical analysis involves calculating the price differential between the term and whole life policies over the twenty years following the current age of the prospective buyer. This is simple addition and subtraction. From the term premium, which increases each year with the age of the purchaser, the term dividends are removed. The dividends are subtracted because, though they are not necessarily applied

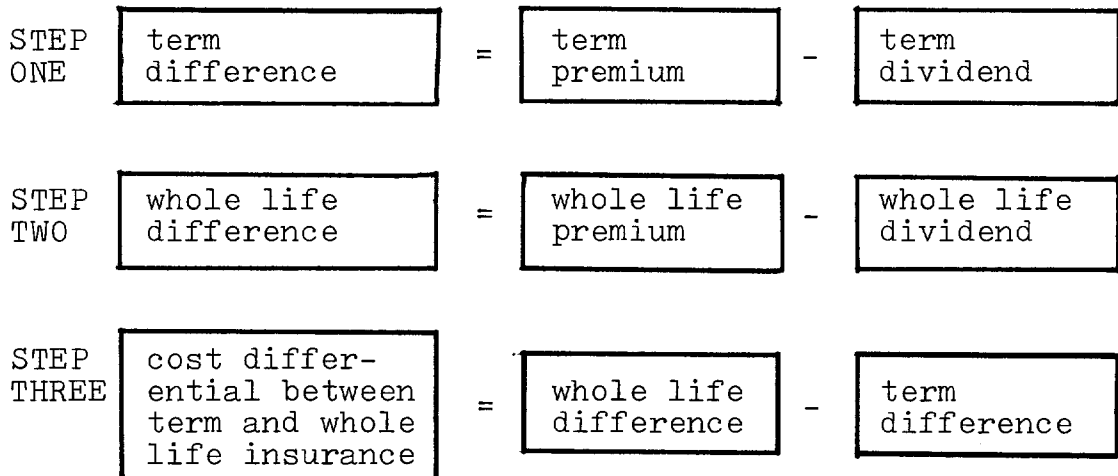
to the reduction of the next year's premium, they essentially reduce the effective cost of the current year's insurance. These twenty differences are temporarily stored until subsequent computations are made.

Next, the computer is instructed to subtract the twenty whole life dividends, which annually accrue to the built-up cash value of the whole life insurance, from the whole life premium for each of the four policies. They are removed because they serve to reduce the dollar amount of the whole life premium, in the same manner that term dividends offset the cost of that insurance. Unlike the term premium, however, the whole life premium does not become larger as the policyholder grows older; rather, the premium remains constant based on the age at which the policy is purchased.

At this time, the differences between the term premium and the term dividends, previously computed, are subtracted from the differences resulting from the deduction of the whole life dividends from the corresponding premium. Each of the interim term calculations is matched with its parallel whole life difference: for instance, the term difference for the first year after the hypothetical purchase is subtracted from the whole life difference after

the first year, and so on. The entire subtraction and addition process can be illustrated by the following diagrams;

Figure 2-2



with the cycle being repeated twenty times for each age and policy, and the data beginning with the current age of the prospective buyer.

After the calculation of the twenty differences, an internal rate of return must be found that equates them with the cash value of the whole life policy on a present value basis. Due to the nature of the arithmetic of the internal rate of return model, there is no computation that leads directly to the correct interest rate. Instead, when an internal rate of return is figured without a computer, the trial-and-error method is employed. The person must estimate a rate of return, then perform the necessary present

value calculations using that rate, with the expectation that the guess is accurate and the cash inflows will equal the outflows. Unless the person possesses an instinct for what the rate should be, minor arithmetic can become tedious.

The computer must also utilize the trial-and-error system. Since computers are highly efficient with regard to time, the rate is found within a fraction of a second. The Fortran program used in this study is no exception. The operator must input an initial rate as a starting point: however, due to the rapidity of the computer it is unnecessary to choose an estimate close to the actual rate. In fact, it is advisable to input a number close to zero, so that the true internal rate of return is not exceeded.

The computer program performs the present value analysis for the initial guess, and if it is too small, the rate is increased in increments of one one hundredth of one percent, or .0001. For example, if .00003 is the initial estimate of the rate necessary to equate the twenty differences with the cash value for a given age of the whole life policy, and .00003 is not sufficiently large, the computer will

add .0001 to .00003, and attempt the present value comparison using a rate of .00013. If that, too, is not large enough, another .0001 is added, and the arithmetic is again executed. The process of incrementing the rate and using it in the actual internal rate of return computation is iterated until the correct rate is reached, at which time the program terminates the cycle, and the computer prints the proper after-tax internal rate of return on the cash value as a four-digit decimal along with the age of the prospective policyholder. Since the program is designed to add to the estimate until it is high enough to be accurate, if the operator inputs a guess that is already greater than the correct answer, then the program will not function properly, and irrelevant numbers will be generated.

#### PRESENTATION OF DATA

The results of the calculations produced by the internal rate of return model are ultimately what concern the buyer. For each age, a single number, the internal yield on the cash value of the various whole life policies, is produced. But viewing the number as simply the rate of return on the policy misses its true nature. While it is correct that the rate observed is the return necessary to equate cash outflows

and inflows, the greater significance of the rate deals with the essential problem of all life insurance buyers; whether term insurance or whole life represents the more effective purchase.

This study offers concrete solutions that are rooted in a well-established financial tool, the internal rate of return. The data plainly demonstrate which of the four whole life policies provides the highest return. More importantly, however, it may also prove that certain types of whole life insurance inherently offer more benefits than could realistically be anticipated in the financial markets, were the money saved by the purchase of the less expensive term insurance independently invested.

The internal rates of return on the four types of whole life policies under study are first presented in Figure 2-3 in order to facilitate comparison. For young life insurance buyers, significant differences among the policies are already present. At age twenty-one, the differential between the policy offering the highest internal rate of return on the cash value, which is the EOL policy, and the lowest yield, calculated on 65-life, is 1.40 percent, or .0140. While no consistent pattern emerges from the comparison of

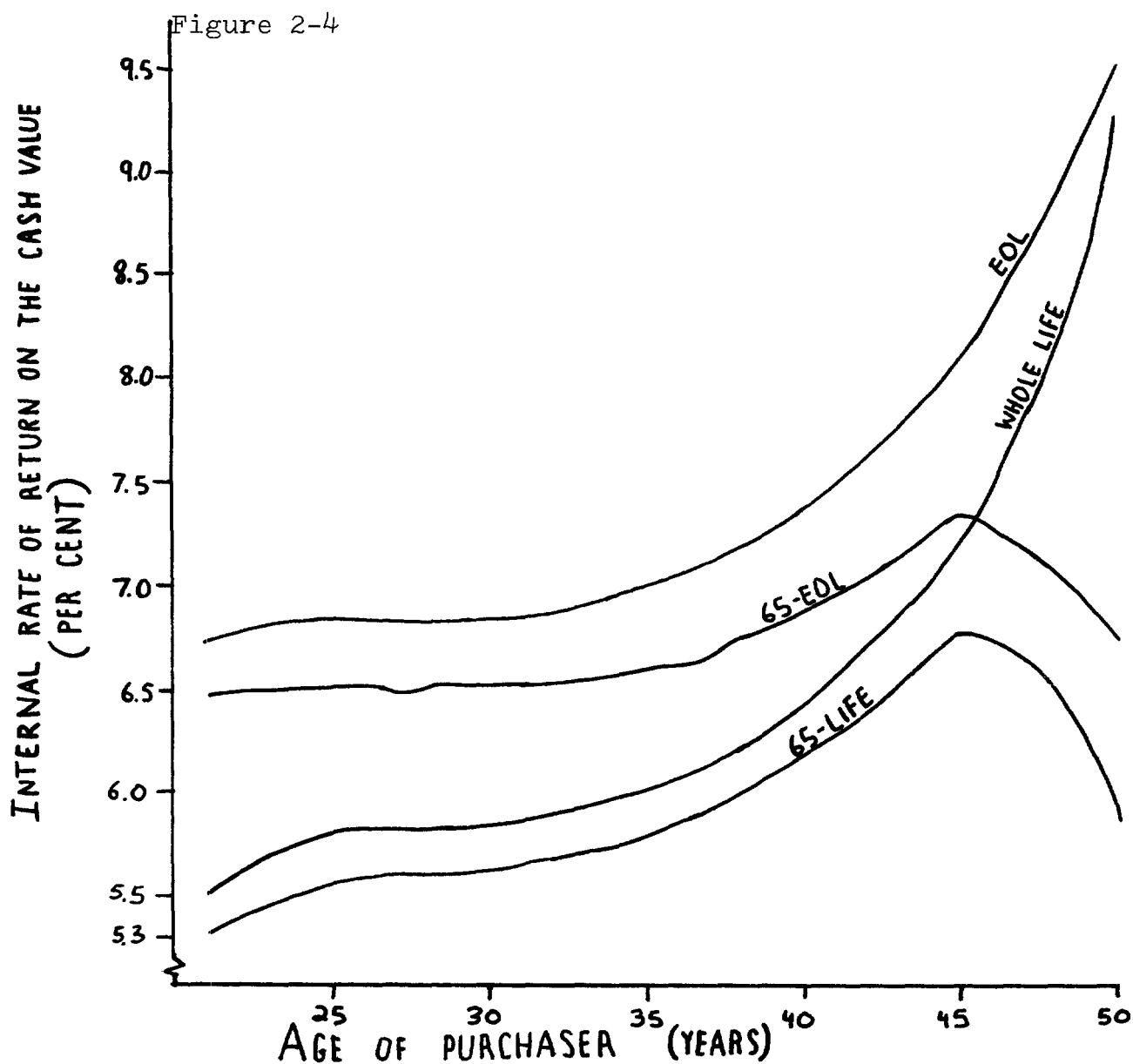
Figure 2-3

## Internal Rates of Return on Cash Values

| <u>Age of<br/>Purchaser</u> | <u>Whole Life</u> | <u>65-Life</u> | <u>EOL</u> | <u>65-EOL</u> | <u>Difference<br/>Between High-<br/>est &amp; Lowest</u> |
|-----------------------------|-------------------|----------------|------------|---------------|--|
| 21                          | .0553             | .0532          | .0672      | .0646         | .0140  |
| 22                          | .0561             | .0537          | .0674      | .0647         | .0137  |
| 23                          | .0567             | .0543          | .0678      | .0647         | .0135  |
| 24                          | .0573             | .0548          | .0679      | .0649         | .0131  |
| 25                          | .0577             | .0553          | .0680      | .0650         | .0127  |
| 26                          | .0578             | .0555          | .0680      | .0649         | .0125  |
| 27                          | .0578             | .0556          | .0679      | .0649         | .0123  |
| 28                          | .0579             | .0558          | .0679      | .0648         | .0121  |
| 29                          | .0579             | .0559          | .0680      | .0649         | .0121  |
| 30                          | .0581             | .0560          | .0680      | .0649         | .0120  |
| 31                          | .0584             | .0563          | .0681      | .0649         | .0118  |
| 32                          | .0586             | .0565          | .0684      | .0650         | .0119  |
| 33                          | .0590             | .0568          | .0687      | .0652         | .0119  |
| 34                          | .0594             | .0572          | .0691      | .0655         | .0119  |
| 35                          | .0598             | .0576          | .0697      | .0658         | .0121  |
| 36                          | .0604             | .0582          | .0701      | .0662         | .0119  |
| 37                          | .0612             | .0588          | .0707      | .0662         | .0119  |
| 38                          | .0620             | .0596          | .0715      | .0672         | .0119  |
| 39                          | .0630             | .0608          | .0724      | .0679         | .0116  |
| 40                          | .0640             | .0613          | .0734      | .0686         | .0121  |
| 41                          | .0653             | .0624          | .0746      | .0693         | .0122  |
| 42                          | .0667             | .0635          | .0758      | .0702         | .0123  |
| 43                          | .0683             | .0648          | .0773      | .0710         | .0125  |
| 44                          | .0700             | .0661          | .0789      | .0720         | .0128  |
| 45                          | .0720             | .0676          | .0807      | .0731         | .0131  |
| 46                          | .0748             | .0669          | .0830      | .0723         | .0161  |
| 47                          | .0779             | .0653          | .0855      | .0713         | .0202  |
| 48                          | .0813             | .0633          | .0883      | .0702         | .0250  |
| 49                          | .0850             | .0610          | .0913      | .0688         | .0303  |
| 50                          | .0893             | .0583          | .0946      | .0672         | .0363  |

the greatest and smallest rates until the last third of the analysis, the difference is always material. From ages thirty-nine to fifty, the interval widens, until in the last year under consideration the difference reaches 3.63 percentage points.

The trends of the internal rates of return of the individual policies may also be represented graphically. When the yield on the cash value, expressed as a percentage on the vertical axis, is compared with the age at which the policy is purchased, on the horizontal axis, the following curves emerge:





The fundamental dividend-bearing whole life policy maintains a relatively stable pattern of growth in the return needed to render outside investments competitive with the life insurance. After a brief plateau from ages twenty-six to twenty-nine, the internal rate of return on the cash value climbs steadily.

This occurs because of the long-term benefits of the whole life level premium. In later years, at a time when term insurance premiums experience precipitous increases, the whole life premium is unchanged. The inclusion of the cost of term insurance in the analysis heightens the value of level-premium insurance; consequently, the rate of return on the whole life cash value is greater. The EOL insurance follows a similar pattern: as with the regular whole life insurance, this is due to the level premium. The internal rates of return on the EOL, however, are higher at every age than the yields of the whole life, because EOL insurance in general is less expensive than whole life, without any apparent reduction in income benefits: the higher rate of return on the EOL once again results from the smaller cash outflows.

The internal rates of return on the cash values of the 65-life and the 65-EOL are both below the regular EOL policy. While the 65-life policy consistently generates the lowest yields, the 65-EOL policy

leads the rates of the whole life policy until age forty-six, when both limited-pay policies begin to decline. The rates decrease at that point because twenty years from age forty-six is the sixty-fifth year, the year in which all premium payments cease. Therefore, the cash value is no longer increasing by the amount of the current year's premium plus interest on the entire sum, but grows through interest alone. Since the 65-life and 65-EOL policies produce a considerably smaller yield than their lifetime premium counterparts, the prospective buyer must weigh the reduced internal rate of return against the significant advantage of having life insurance premiums stop at the same time that retirement brings a greatly diminished income.

## CHAPTER III

SUMMARY

Once again, the intent of this study is to investigate the role of life insurance in the financial plan for the years following retirement. The internal rate of return on the cash value of four life insurance policies: whole life, 65-life, extra ordinary life, and 65-EOL, were determined. For the information to have value, the orientation must extend beyond whole life insurance alone.

The broad interpretation of the data proposes that opponents of the relatively high premiums of whole life insurance and its variations purchase the less costly term insurance, and invest the cost savings in common stocks, time deposits, and other instruments of the financial markets. The internal rates on these policies represent the after-tax yield that must be realized in the open market to justify the sacrifice of the benefits that cash value life insurance affords. Antecedent to any life insurance purchase, it is necessary to consider not only the relative merits and undesirable characteristics of term insurance and the four types of whole life, but also the current economic and financial environments, and the individual needs of the buyer.

The purchase decision will be different in times of inflation and volatile business and interest cycles from what would be chosen during a period of relative economic stability. Similarly, a person viewing the life insurance policy from an investment perspective possesses different ideas of what constitutes the optimal policy than does the buyer who seeks coverage alone. Therefore, before attempting to proclaim one policy or one type of insurance as superior solely on the basis of the numeric data, an analysis of all relevant individual circumstances is obligatory.

#### CONCLUSIONS

Two types of conclusions can be reached from this investigation. The first, which is merely a subset of the second, more comprehensive concept, concerns the four cash value-accumulating policies and measures their advantages relative to one another. This information constitutes background data, an understanding of which is required before subsequent conclusions assume relevance.

### Conclusions Concerning The Numeric Analysis

1. The regular EOL policy offers a consistently higher internal rate of return on the cash value. At every age, the rate is higher; though if the data were extrapolated several years into the future, it appears likely that the internal rate of return on the EOL policy would soon be eclipsed by that of the basic whole life policy. For the time frame under consideration, however, the EOL is clearly the superior life insurance policy with regard to the internal rate of return criterion.
2. The second highest internal rates of return are present on the regular whole life policy. While whole life lags behind all but the 65-life policy for most of the thirty ages examined, it ascends abruptly over approximately the final ten years, and would probably produce the highest yield over the long run.
3. The 65-EOL policy treads a moderate path: at no time is the yield either the highest or lowest. 65-EOL insurance is appropriate for those who anticipate a substantial reduction in income after retirement. Though the internal rate of return on the cash value

does decrease after the cessation of the premium payments, the decline is less severe than that which is experienced on 65-life. 65-EOL is the optimal policy for all consumers who demand that the premiums do not continue after they enter retirement.

4. 65-life insurance emerges as the poorest use of funds. The internal rate of return is unmistakably inferior to those of its three counterparts, and the decline of the yield over the last few years is more drastic than is observed on the 65-EOL. When all factors are considered, the benefits of a life insurance policy that is paid-up by age sixty-five are more efficiently realized through the acquisition of a 65-EOL policy, which requires a smaller premium outlay and consequently generates a higher yield.

#### Conclusions On The Value Of Insurance As An Investment

The final conclusions of this study embody the fundamental purpose of the investigation. They will enable the prospective insurance buyer to evaluate all four types of whole life insurance against the potential advantages of purchasing term insurance and investing savings in other financial instruments.

1. The internal rates of return of each of the cash value policies are not as large as the before-tax returns on other currently popular investments. In today's world of interest rates increasing beyond all historical limits, the yields on corporate debt, mortgages, and all other products of the various financial institutions significantly exceed the internal rates of return on the life insurance. The important consideration here, however, is the after-tax nature of the insurance yields. Since insurance benefits are rarely taxable, they enjoy a decided advantage over all other investments, which are subject to either capital gains or ordinary income taxes.

For those investors whose incomes are such that they must pay taxes at a high marginal rate, receipts from investments are materially diminished by taxes. Due to this, many times their effective yields become commensurate with those inherent in the cash values of the life insurance, especially when one includes the broker's fees charged on conventional investments. The study offers evidence of the concept that whole life insurance is more beneficial than purchasing term and investing the difference in premiums for those individuals whose overall earnings place them at a high marginal tax rate.

2. The fact that the yields on the cash values of life insurance policies do not approach the current rate of inflation is obvious. Though it is true that all investments except rare commodities, dubious corporate debt instruments, and a few maverick common stocks fail to parallel the rate of inflation, it is often argued that life insurance benefits incur more critical losses than other savings media. While this reasoning is easily supported by even the most superficial comparison of the internal rates of return on the cash values of life insurance with recent rates of inflation, this position ignores the crucial element of risk. The business environment of the last ten years is plagued by an unrelenting inflationary trend which carries with it cyclical recessions of increasing magnitude. Because of this situation, many enterprises are unable to survive, and concomitant with their demise are the suddenly valueless stocks and debt instruments. Investors placing their savings in such ill-fated ventures have no recourse, and are left without funds for the retirement years.

Life insurance companies, unlike most other industries, are founded on the principles of security and conservatism. The probability that a



large insurance company, such as Northwestern Mutual, will fall into bankruptcy is negligible. Although life insurance benefits experience substantial erosion because of the long-run effects of inflation, the rates of return presented in this study may be minimal from some perspectives, but these minimal returns are a virtual certainty. Ultimately, life insurance represents an investment bearing almost no default risk; herein lies the attraction of whole life. For the risk-averse individual, more satisfaction would be derived from the purchase of whole life insurance than the investment of money saved on term premiums in risk-ridden enterprises.

3. Lastly, even in the event that risk-free investments were available, at yields that enabled them to withstand inflation and income taxes, the danger is always extant that the individual who purchases the less expensive term insurance will not be assiduous in the accumulation of funds to be invested. Many people possess the good intention of saving for their retirement but lack the discipline to resist the inevitable purchases that prevent the regular deposits necessary to collect a sum, which when

added to the income on its investment, is sufficient to ensure maintenance of the post-retirement standard of living. Life insurance, on the other hand, in effect forces the policyholder to save through the payment of regular premiums. Thus, life insurance is a safe means of ensuring that money urgently needed for later years is not dissipated through a multitude of meaningless expenditures. The "forced-saving" aspect of life insurance enhances its value to the sector of the population that finds it difficult to save effectively; and that sector is considerable, especially today, when prices tend to rise faster than income, placing a strain on the will to save.

#### SUGGESTIONS FOR FURTHER STUDY

This study represents only a minute investigation into a multi-faceted problem. Following are proposals for continued study in the area of whole life insurance versus buying term and privately investing any savings on premium costs:

1. Data from several insurance companies of varying sizes should be analyzed.
2. A compilation of a survey of current rates of return on other financial assets would expedite the comparison of those rates with the internal rates of return on the cash value of life insurance.

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